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129-54891
For The Atomic Energy Commission
Edward J. Purina for the
Chief, Declassification Branch

12
Reading File
January 7, 1968
91

GENERAL LABORATORIES
CENTRAL FILES NUMBER
48-1-134

To: R.H. Firminhac
From: T.H.J. Burnett
Subject: Waste Monitoring Group Report for December, 1967

This document has been approved for release to the public by

AIR ACTIVITY MONITORING AND STUDY

David R. Hammin 1/30/68
Technical Information Officer Date
ORNL Site

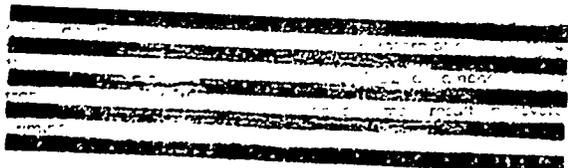
General (Instrumentation)

Instrument difficulties have continued during December in practically all phases of our endeavours. Data loss on the 3 outdoor constant air monitors was down to 37%, of which part was due to lost time in replacement of the Trafficounters by Esterline-Angus operations meters. This replacement was completed during December and so far appears to offer promise of greater reliability. Wind data loss was down to 3%.

Air Contamination Instances

The maximum upsurges of air activity recorded during December are tabulated as follows, on the basis of the one year tolerance value of 8.5×10^{-8} $\mu\text{c}/\text{cc}$ for I¹³¹:

% Tolerance	Date	Approximate Duration
9%	December 3	11 hrs.
15%	December 6	3 hrs.
10%	December 29	6 hrs.



In the above instances the decay in values noted was rapid. It is noteworthy that no Ba¹⁴⁰ run was made during December, in connection with the low values of activity observed.

Because of the activities in the pile building removing ruptured and jammed slugs, a set of special precipitron tests were run and separately reported by T.H.J. Burnett to R.H. Firminhac, December 12, 1947 titled "Air Activity Measurements December 9, 1947"

Meteorological Data

There were 29 inversions during December, accompanying which were slight rises of air activity inversely proportional to the wind velocity.

Rainfall during December was 3.00 inches to compare with 4.76 inches in November and the average for 1947 of 3.55 inches.

Wind Direction frequency percentages and average hourly directional velocities are:

Direction	Frequency	Velocity
North	4.9%	4.1 mi/hr
Northeast	0.3%	2.0 mi/hr
East	42.8%	5.0 mi/hr
Southeast	5.4%	5.4 mi/hr
South	7.8%	4.1 mi/hr
Southwest	26.2%	6.9 mi/hr
West	10.6%	6.5 mi/hr

Sundry

Tests on the new precipitron have been subject to a variety of instrument failure troubles and additional equipment is being obtained. The corresponding filteron and orifice calibrations are therefore likewise delayed.



LIQUID WASTE DISPOSAL MONITORING AND INVESTIGATION

Routine Monitoring Results

Immersion β counts of 20 daily samples each of Dam and Settling basin water indicate an activity concentration reduction factor of 11.5 which would be expected is less than for November accompanying the lesser rainfall in December. Precise correlation will require constant water monitoring equipment usage.

Total β curies discharged from the Settling Basin were 2% less than in November and 29% less than the monthly average for 1947.

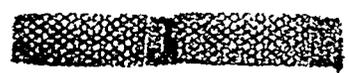
Beta Water Counting

The usage of 1 liter samples has proven satisfactory and enabled the backlog of uncompleted work to be held at a minimum despite shortage of personnel due to illness.

The large 7 unit hotplate was rewired and operates much better. Additional power was made available for the lab hot plates and heat lamps towards the end of the month after being handicapped for a considerable time in their full usage.

Sickness has postponed the annual mud survey but it is hoped that trainees may be available to assist in this practical phase of waste monitoring during January.

A sample of Y-12 discharge water was obtained for activity measurements to compare with later values.



General

A dead wildfowl was found by the dam and when checked to see if it might have died from radioactivity was found to have quite respectable quantities of activity. A separate report is being made of this in detail.

Silting measurements have still not been begun owing, among other things to personnel handicaps.

A project for electric power at White Oak Dam is in some stage of progress, and when complete will allow constant water monitoring to be done there.

The dock for more extensive river work is scheduled to be completed in January.

The study of a slow flow area for improvement in settling out of activity is progressing and should be ready soon for choice of methods and approval


T.H.S. Burnett

THJB:rr

Distribution

1. R.H. Firminhac
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3. F. Western
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5. W.H. Ray
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C. 7

CLASSIFICATION CANCELLED
DATE 12-15-54
For The Atomic Energy Commission
717
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- 7. W. D. Cottrell
- 8. R. G. Lawler
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June 11, 1948

SAK RIDGE NATIONAL LABORATORY
CENTRAL FILES NUMBER
48-6-189

To: J. C. Hart

From: W. D. Cottrell

Subject: Waste Monitoring Weekly Report for the Week Ending June 5, 1948.

AIR ACTIVITY MONITORING AND STUDY

General

The percentage data loss for the week ending June 5, 1948 was 14.1% on the three outdoor constant air monitors and 16.1% on the wind direction and velocity recording instrument. These figures compare with 1.4% on the air monitors and 7.2% wind data loss for the previous week.

Air Contamination Instances

In three instances the air activity rose above 10% of the tolerance value of 8.5×10^{-8} $\mu\text{c}/\text{cc}$ for I^{131} . All instances occurred during periods of low wind velocity and thermal inversion. The duration of these periods of activity was approximately 4 hours and the contamination occurred at times which would give a possible exposure to the minimum number of personnel.

Meteorological Data

Number of Inversions	7
Inches of Rainfall	None
Prevailing Wind Direction	East - 59%
Average Wind Velocity	6.5 mi/hr

Wind direction frequency percentages and average directional velocities are tabulated on the following page.

[REDACTED]

Publicly Releasable

This document has received the necessary patent and technical information reviews and can be distributed without limitation.

[REDACTED]

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4-15-59
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<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	1.4%	3.5 mi/hr
Northeast	1.4%	9.0 mi/hr
East	58.8%	7.7 mi/hr
Southeast	0.7%	1.0 mi/hr
South	0.7%	< 1.0 mi/hr
Southwest	9.9%	5.0 mi/hr
West	26.9%	4.7 mi/hr
Northwest	0.0%	---

LIQUID WASTE DISPOSAL MONITORING AND RESEARCH

Routine Monitoring Results

Immersion gamma counts of 4 daily samples each of Dam and Settling Basin Water indicate an activity reduction factor of 22.7 as compared to a factor of 24.4 as indicated by the beta counts on the same number of samples on the same dates.

Attached is a tabulation of the gamma radiation values together with the approximate amounts of radiation which would be received from beta emitters in the effluents on the same days surveyed. These gamma values represent radiation intensities on the basis of immersion in infinite volume assuming an average gamma ray energy of 0.7 Mev. The beta values are calculated according to the methods set forth in CH-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K. Z. Morgan, assuming an average beta ray energy of 0.3 Mev.

The gamma determinations made at the laundry for this week showed 12.5 discrepancies. In one case out of eight, the net count on the small vessel was larger than the net count on the large vessel. These determinations were made by the single vessel method using a large and a small vessel.

Discharge activity averages and pertinent data are tabulated below.

	<u>Week Ending</u> <u>June 5</u>	<u>Week Ending</u> <u>May 29</u>	<u>Week Ending</u> <u>May 22</u>
Settling Basin	0.25 mr/hr	0.19 mr/hr	0.31 mr/hr
White Oak Dam	0.11 mr/hr	0.02 mr/hr	0.03 mr/hr
Rainfall	None	0.90 inches	None
Curies Discharged	8.7 total	8.7 total	13.1 total

General

Special particle studies were started this week. These studies include microscopic, spectroscopic, and decay analyses. Collectors will be spotted around the area in an effort to monitor these particles and as a further means of locating their source.

W. D. Cottrell
W. D. Cottrell
Waste Disposal Survey

WDC:cs

DATE	Settling Basin		White Oak Dam	
	\bar{S} mrep/hr* 206 - 11 A.M. Analyses	\bar{Y} m/hr** Waste Mon. Analyses	\bar{S} mrep/hr* Waste Mon. Analyses	\bar{Y} m/hr** Aver. Small and Large
6-1-48	0.54	0.10	0.04	0.01
6-2-48	0.52	0.60	0.04	0.01
6-3-48	0.45	0.57	0.04	0.01
6-4-48	<u>0.13</u>	<u>2.63***</u>	<u>0.03</u>	<u>0.01</u>
Average	0.41	0.98	0.04	0.01

* mrep/hr = 2.8×10^{-3} N (N = c/m/ml)

** m/hr = 6.2×10^{-4} x S/3 (S = c/m small cylinder)

** m/hr = 4.1×10^{-4} x L/3 (L = c/m large cylinder)

*** Algae was hosed down in Settling Basin on 6-4-48

<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	20.8%	3.3 mi/hr
Northeast	0.6%	2.0 mi/hr
East	31.2%	5.8 mi/hr
Southeast	10.2%	4.6 mi/hr
South	33.3%	6.7 mi/hr
Southwest	2.4%	6.5 mi/hr
West	1.8%	8.7 mi/hr
Northwest	0.0%	---

LIQUID WASTE DISPOSAL AND RESEARCH

Routine Monitoring Results

Immersion gamma counts of four daily samples each of Dam and Settling Basin Water indicate an activity reduction factor of 77.8 as compared to a factor of 36.7 as indicated by the same number of beta counts taken at the same time.

In the attached tabulation are given the gamma radiation values together with the approximate amounts of radiation that would be received from beta emitters in the effluents on the same days surveyed. These values represent radiation intensities on the basis of immersion in infinite volume assuming an average gamma ray energy of 0.7 Mev. and an average beta ray energy of 0.3 Mev. All values are calculated according to the methods set forth in CH-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K. Z. Morgan.

Discharge activity averages and pertinent data are tabulated below:

	<u>Week Ending</u> <u>July 10</u>	<u>Week Ending</u> <u>July 3</u>	<u>Week Ending</u> <u>June 26</u>
Settling Basin	0.340 mr/hr	0.27 mr/hr	0.12 mr/hr
White Oak Dam	0.004 mr/hr	0.01 mr/hr	0.01 mr/hr
Rainfall	0.400 inches	0.30 inches	0.70 inches
Curies Discharged	5.02 total	12.2 total	7.27 total

General

Two hot specks have been found on the frame collectors that have been out approximately three weeks. These specks read 1.1 mr/hr and 1.8 mr/hr with V-263 and were approximately 85 μ and 95 μ in size respectively.

"Operation Particle" was designated as a special project on 7-9-48 and all data including the above mentioned specks was turned over to J. S. Chaka for further investigation.

Because of a bursted water main, water from a spring fed pond north of J. A. Jones farm house #733 was pumped into the X-10 water supply. An analysis gave 4.9×10^{-7} $\mu\text{c}/\text{cc}$ of beta-gamma activity. An analysis for alpha activity is being made by L. B. Farabee.

W. D. Cottrell
W. D. Cottrell
Waste Disposal Survey

WDC:cs

- - - - - Settling Basin - - - - -
 \bar{S} mrep/hr* \bar{S} mrep/hr**
 206 - 11 A.M. Waste Mon. Aver. Small
 Analyzes*** Analyzes and large

- - - - - White Oak Dam - - - - -
 \bar{S} mrep/hr* \bar{S} mrep/hr**
 Waste Mon. Aver. Small
 Analyzes and large

Date	\bar{S} mrep/hr*	\bar{S} mrep/hr**	\bar{S} mrep/hr*	\bar{S} mrep/hr**
7-6-48	0.112	0.115	0.039	0.020
7-7-48	0.855	1.067	0.635	0.017
7-8-48	0.454	1.014	0.510	0.014
7-9-48	0.492	0.406***	0.179***	0.020
Average	0.478	0.651	0.341	0.018

* mrep/hr = 2.8×10^{-3} N (N = c/m/ml)

** mrep/hr = 6.2×10^{-4} x S/S (S = c/m small cylinder)

** mrep/hr = 4.1×10^{-4} x L/S (L = c/m large cylinder)

*** Samples taken from Settling Basin. Remainder of samples taken from east pond.

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|---------------------|--------------------|
| 1. J. C. Hart | 9. R. G. Lawler |
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| 4. F. Western | 12. O. R. Placak |
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July 29, 1948

9AK RIDGE NATIONAL LABORATORY
 CENTRAL FILES NUMBER
 48-3- 46

- WASTE MONITORING WEEKLY REPORT FOR WEEK ENDING JULY 24, 1948

I. Air Activity Monitoring and Study

A. General

The percentage data loss for the week ending July 24, 1948 was 11.7% on the three outdoor constant air monitors and 22.4% on the wind direction and velocity recording instrument. The data loss on the individual air monitors was 15.4% on 706-A, 2.3% on 115-B, and 17.2% on 735-B.

B. Air Contamination Instances

In four instances the air activity rose above 10% of the tolerance value of 8.5×10^{-8} $\mu\text{c}/\text{cc}$ for I^{131} . These instances occurred during periods of low wind velocity and thermal inversion. The average duration of these instances was approximately one hour and three of the four occurred at times other than on the 8-4 shift thus giving a possible exposure to the minimum number of personnel.

C. Meteorological Data

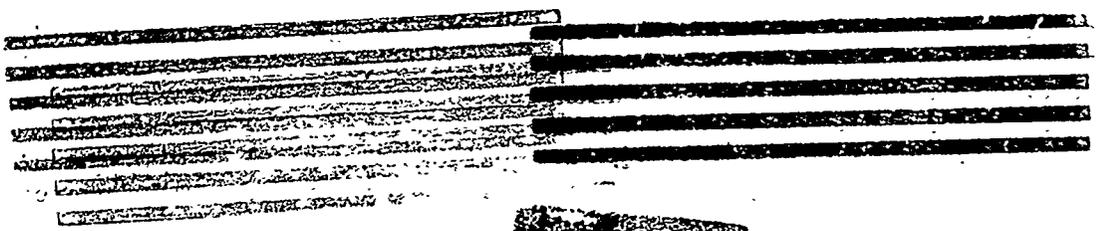
1. Number of Inversions - 4
2. Inches of Rainfall - 0.60
3. Prevailing Wind Direction - S.W. - 33%
4. Average Wind Velocity - 4.1 m.p.h.

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Per Letter Instruction

T/D-1045

9/8/53
 W.C. Boyer for
 H. Gray
 SUPERVISOR CENTRAL FILES
 95NL





Wind direction frequency percentages and average directional velocities are tabulated below:

<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	4.5%	4.2 m.p.h.
Northeast	0.0%	---
East	16.7%	2.3 m.p.h.
Southeast	7.6%	5.0 m.p.h.
South	11.4%	2.0 m.p.h.
Southwest	33.3%	5.4 m.p.h.
West	26.5%	4.1 m.p.h.
Northwest	0.0%	---

II. Liquid Waste Disposal and Research

A. General

A preliminary trip was made down Clinch River to test the new mud clam for river bottom sampling. On the basis of the limited number of samples taken, the new sampler is much superior to the mud clam previously used. The hood over the sample evaporator is nearing completion and should be in operation soon.

A total of 25 mud samples and three run-off samples were assayed and studied for correlation this week.

B. Routine Monitoring Results

Immersion gamma counts of five daily samples each of Dam and Settling Basin water indicate an activity reduction factor of 40.2 as compared to a factor of 31.0 as indicated by the same number of beta counts taken at the same time.

In the attached tabulation are given the gamma radiation values together with the approximate amounts of radiation that would be received from beta emitters in the effluents on the same days surveyed. These values represent radiation intensities on the basis of immersion in infinite volume assuming an average gamma ray energy of 0.7 Mev. and an average beta ray energy of 0.3 Mev. All values are calculated according to the methods set forth in CH-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K. Z. Morgan.





WASTE MONITORING REPORT

Discharge activity averages and pertinent data are tabulated below:

	<u>Week Ending July 24</u>	<u>Week Ending July 17</u>	<u>Week Ending July 10</u>
Settling Basin	0.257 mr/hr	0.239 mr/hr	0.340 mr/hr
White Oak Dam	0.006 mr/hr	0.007 mr/hr	0.004 mr/hr
Rainfall	0.60 inches	3.50 inches	0.40 inches
Curies Discharged	8.78 total	6.88 total	5.02 total

W. P. Cottrell
W. P. Cottrell
Waste Monitoring

WDC:cs



--- White Oak Dam ---
 mrep/hr* δ mr/hr**
 Waste Mon. Aver. Small
 Analyses and Large

--- Settling Basin ---
 mrep/hr* δ mr/hr**
 206 - 11 A.M. Waste Mon. Aver. Small
 Analyses and Large

Date	mrep/hr*	δ mr/hr**	mrep/hr*	δ mr/hr**
7-19-48	0.342	0.282	0.014	0.010
7-20-48	0.655	0.668	0.014	0.005
7-21-48	0.645	1.719	0.028	0.002
7-22-48	0.689	0.594	0.022	0.010
7-23-48	24.21 ***	0.800	0.020	0.007
Average	0.583	0.608	0.020	0.006

* mrep/hr = 2.8×10^{-3} N (N = c/ml)

** mr/hr = $6.2 \times 10^{-4} \times S/3$ (S = c/m small cylinder)

** mr/hr = $4.1 \times 10^{-4} \times L/3$ (L = c/m large cylinder)

*** This value was not used in computing average - sample not representative.

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 DATE 12-15-54
 For The Atomic Energy Commission
 H. F. G. [Signature]
 Chief, Declassification Branch

1. J. C. Hart
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14. C. Files
15. R. Files

ORNL NATIONAL LABORATORY

September 9, 1948

GENERAL FILES NUMBER
 48-3-80

WASTE MONITORING WEEKLY REPORT FOR WEEK ENDING SEPTEMBER 4, 1948

I. Air Activity Monitoring and Study

A. General

The percentage data loss on the three outdoor constant air monitors was 18.8% for the week ending September 4, 1948 as compared to 17.1% for the previous week. The percentage wind data loss was 23.2%. The individual data losses on the air monitors were 31.5% on 706-A, 11.3% on 115-B, and 13.7% on 735-B.

B. Air Contamination Instances

In six instances the air activity rose above 10% of the tolerance value of 8.5×10^{-11} $\mu\text{c}/\text{cc}$ for I^{131} . This activity seems to consist of both short and relatively long lived material some of which is particulate in nature. Three samples taken on September 3 showed an average of approximately 29% decay in four days. This period of increased air activity occurred during a period of very low rainfall and generally dusty conditions in the plant area. One of the major causes of this can be attributed to the recirculation of dust particles by wind currents. This condition seems to have been alleviated to some extent over the weekend by spreading oil on roads and other dusty surfaces.

C. Meteorological Data

Number of Inversions	7
Inches of Rainfall	0.20
Prevailing Wind Direction	East - 45.7%
Average Wind Velocity	5.7 m.p.h.

Wind direction frequency percentages and average directional velocities are tabulated on the following page.

[REDACTED SECTION]



<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	12.4%	7.8 m.p.h.
Northeast	0.0%	---
East	45.7%	6.5 m.p.h.
Southeast	15.5%	5.2 m.p.h.
South	9.3%	2.4 m.p.h.
Southwest	10.9%	4.5 m.p.h.
West	6.2%	3.8 m.p.h.
Northwest	0.0%	---

II. Liquid Waste Disposal Monitoring and Research

A. General

The placing of more air monitors around the area is contemplated in the near future. A logarithmic count rate meter is being considered as a substitute for the one now in use. If this proves satisfactory it will give greater accuracy as well as reduce greatly the time required to take data from the charts and work it into usable form.

On September 2, 1948, R. J. Morton, L. R. Setter, O. R. Placak and W. D. Cottrell made a preliminary survey of Clinch River from mile 21 to mile 12. Samples of mud, water, algae, and plankton were collected for analysis and study.

B. Routine Monitoring Results

Immersion gamma counts of 3 daily samples each of Dam and Settling Basin Water indicate an activity reduction factor of 20.3 compared to 21.7 as indicated by the results of the gross beta analysis of the same number of samples on the same days.

Attached is a tabulation of the gamma radiation values together with the approximate amounts of radiation which would be received from beta emitters in the effluents on the same days surveyed. These values represent radiation intensities on the basis of immersion in infinite volume assuming an average gamma ray energy of 0.7 Mev. and an average beta ray energy of 0.3 Mev. All values are calculated according to the method set forth in CH-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K. Z. Morgan.

Discharge activity averages and pertinent data are tabulated below:

	<u>Week Ending</u> <u>Sept. 4</u>	<u>Week Ending</u> <u>August 28</u>	<u>Week Ending</u> <u>August 21</u>
Settling Basin	0.369 mr/hr	0.393 mr/hr	0.4202 mr/hr
White Oak Dam	0.017 mr/hr	0.021 mr/hr	0.017 mr/hr
Rainfall	0.20 inches	0.0 inches	0.40 inches
Curies Discharged	21.05 total	19.67 total	15.49 total

W. D. Cottrell
W. D. Cottrell
Waste Monitoring

--- White Oak Dam ---
 mrep/hr* δ m/hr**
 Waste Mon. Aver. Small
 Analyses and Large

--- Settling Basin ---
 mrep/hr* δ m/hr**
 Waste Mon. Aver. Small
 Analyses and Large

--- 206 - 11 A.M. ---
 mrep/hr*
 Analyses

Date	0.825	1.066	0.200	0.070	0.018
8-30-48					
9-1-48	1.370	1.276	0.428	0.058	0.019
9-3-48	1.336	1.234	0.481	0.053	0.016
Average	1.177	1.199	0.369	0.060	0.017

* mrep/hr = 2.8×10^{-3} N (N = c/ml)

** m/hr = 6.2×10^{-4} S/3 (S = c/m small cylinder)

** m/hr = 4.1×10^{-4} L/3 (L = c/m large cylinder)

CLASSIFICATION CANCELLED
 DATE 12-23-84
 For The Atomic Energy Commission
 Chief, Declassification Branch

1. J. C. Hart
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September 15, 1948

OAK RIDGE NATIONAL LABORATORY

CENTRAL FILES NUMBER

e.f. 48-9-147

WASTE MONITORING WEEKLY REPORT FOR WEEK ENDING SEPTEMBER 11, 1948

I. Air Activity Monitoring and Study

A. General

The percentage data loss on the three outdoor constant air monitors was 15.7% for the week ending September 11, 1948 as compared to 18.8% for the previous week. The percentage wind data loss was 7.18%. The individual data losses on the air monitors were 0.0% on 706-A, 38.7% on 115-B, and 8.3% on 735-B.

B. Air Contamination Instances

In three instances the air activity rose above 10% of the tolerance value of 8.5×10^{-11} $\mu\text{c}/\text{cc}$ for I131. These instances of activity have decreased considerably this week both in number and in intensity. This correlates with increased rainfall for this period and with the recent efforts to minimize the recirculation of dust particles.

C. Meteorological Data

Number of Inversions	6
Inches of Rainfall	1.35
Prevailing Wind Direction	S.W. - 33.8%
Average Wind Velocity	4.7 m.p.h.

Wind direction frequency percentages and average directional velocities are tabulated on the following page.

[REDACTED SECTION]

[REDACTED SECTION]

<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	0.0%	---
Northeast	0.0%	---
East	33.1%	5.1 m.p.h.
Southeast	7.0%	10.1 m.p.h.
South	12.7%	2.4 m.p.h.
Southwest	33.8%	5.5 m.p.h.
West	13.4%	1.8 m.p.h.
Northwest	0.0%	---

II. Liquid Waste Disposal Monitoring and Research

A. General

Maintenance work on the Settling Basin is essentially complete. This will enable us to install a constant sampling device for sampling the Settling Basin effluent.

J. Z. Holland of the AEC is compiling meteorological data from our records as a basis for establishing weather observation stations around the X-10 Area.

B. Routine Monitoring Results

Immersion gamma counts of 4 daily samples each of Dam and Settling Basin Water indicate an activity reduction factor of 33.8 compared to 28.9 as indicated by the results of the gross beta analysis of the same number of samples on the same days.

Attached is a tabulation of the gamma radiation values together with the approximate amounts of radiation which would be received from beta emitters in the effluents on the same days surveyed. These values represent radiation intensities on the basis of immersion in infinite volume assuming an average gamma ray energy of 0.7 Mev. and an average beta ray energy of 0.3 Mev. All values are calculated according to the method set forth in CH-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K. Z. Morgan.

Discharge activity averages and pertinent data are tabulated below:

	<u>Week Ending</u> <u>Sept. 11</u>	<u>Week Ending</u> <u>Sept. 4</u>	<u>Week Ending</u> <u>August 28</u>
Settling Basin	0.709 mr/hr	0.369 mr/hr	0.393 mr/hr
White Oak Dam	0.021 mr/hr	0.017 mr/hr	0.021 mr/hr
Rainfall	1.35 inches	0.20 inches	0.0 inches
Curies Discharged	19.09 total	21.05 total	19.67 total

W. D. Cottrell
W. D. Cottrell
Waste Monitoring

White Oak Dam
 mr/hr**
 Waste Mon. Aver. Small
 and Large

Settling Basin
 mr/hr**
 Waste Mon. Aver. Small
 and Large

206 - 11 A.N.
 Analyses

Date	206 - 11 A.N. Analyses	Settling Basin mr/hr** Waste Mon. Aver. Small and Large	White Oak Dam mr/hr** Waste Mon. Aver. Small and Large
9-7-48	1.245	1.472	0.050
9-8-48	1.620	1.870	0.067
9-9-48	1.400	1.724	0.067
9-10-48	1.770	2.007	0.058
Average	1.509	1.768	0.061

* mrep/hr = 2.8×10^{-3} N (N = c/m/ml)

** mr/hr = 6.2×10^{-4} S/3 (S = c/m small cylinder)

** mr/hr = 4.1×10^{-4} L/3 (L = c/m large cylinder)

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16. R. Files

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OAK RIDGE NATIONAL LABORATORY

October 27, 1948

CENTRAL FILES NUMBER

48-11-52

AREA MONITORING WEEKLY REPORT FOR WEEK ENDING OCTOBER 24, 1948

I. Air Activity Monitoring and Study

A. General

The percentage data loss on the three outdoor constant air monitors was 0.6% for the week ending October 24, 1948 as compared to 18.1% for the previous week. The percentage wind data loss was 14.3%.

The need for accurate meteorological data at X-10 was discussed with J. Z. Holland, A.T.C. Meteorologist, and it was concluded that to secure this, an adequate tower should be erected. This tower should extend 100 feet above stack height, be of such construction as to support standard meteorological instruments and should allow for servicing of instruments three or four times a year. Mr. Morris of Engineering is investigating the types of towers available for this purpose and will give us cost estimates when this is completed.

B. Air Contamination Instances

In four instances the air activity rose above the tolerance value of 8.5×10^{-11} $\mu\text{c}/\text{cc}$ for I^{131} . These instances occurred at times which would give a possible exposure to the minimum number of personnel.

C. Meteorological Data

Number of Inversions	5
Inches of Rainfall	1.65
Prevailing Wind Direction	N.E. - 40.9%
Average Wind Velocity	4.6 m.p.h.

Wind direction frequency percentages and average directional velocities are tabulated on the following page.

~~This document contains information which is classified within the meaning of the Atomic Energy Act of 1946 and/or information affecting the national defense of the United States within the meaning of the Espionage Act, 50 U.S.C. 31 (a)(1) and the disclosure of its contents in any manner, or its transmission, is prohibited and may result in severe criminal penalty.~~



<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	11.1%	3.3 m.p.h.
Northeast	40.9%	5.1 m.p.h.
East	4.9%	2.6 m.p.h.
Southeast	1.4%	1.5 m.p.h.
South	4.9%	2.9 m.p.h.
Southwest	19.4%	5.5 m.p.h.
West	12.5%	3.7 m.p.h.
Northwest	4.9%	7.3 m.p.h.

II. Counting Facility and Laundry Decontamination Measurements

A. General

The number of air samples counted this week showed a decrease of 64.5% as compared to the number counted last week.

B. Routine

Given below is a summary of the counting service given and the laundry decontamination measurements made.

1. Counting Service Items	1869
a. Air Samples	70
b. Mud, Water and Smear Samples	1481
c. Graphical Data and Special	<u>318</u>
2. Laundry Decontamination Measurements	7186
a. Garments Checked	3897
b. Other Clothing and Special Items	3274
c. Shoes (pr) Checked	5
d. Water Samples Counted	<u>10</u>

III. Liquid Waste Disposal Monitoring and Research

A. General

The average gamma immersion value for the Settling Basin effluent decreased 60.5% and the gross beta average 63.2% as compared to the averages for last week. This decrease was caused by the temporary shutdown in operations.

B. Routine Monitoring Results

Immersion gamma counts of 5 daily samples each of Dam and Settling Basin water indicate an activity reduction factor of 13.1 compared to 10.6 as indicated by the results of the gross beta analysis of the same number of samples on the same days.

Attached is a tabulation of the gamma radiation values together with the approximate amounts of radiation which would be received from beta emitters in the effluents on the same days surveyed. These values represent radiation intensities on the basis of immersion in infinite volume assuming an average gamma ray energy of 0.7 Mev. and an average beta ray energy of 0.3 Mev. All values are calculated according to the method set forth in CH-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K. Z. Morgan.

Discharge activity averages and pertinent data are tabulated below:

	<u>Week Ending</u> <u>Oct. 24</u>	<u>Week Ending</u> <u>Oct. 17</u>	<u>Week Ending</u> <u>Oct. 10</u>
Settling Basin	0.184 mr/hr	0.487 mr/hr	0.532 mr/hr
White Oak Dam	0.014 mr/hr	0.015 mr/hr	0.019 mr/hr
Rainfall	1.65 inches	0.00 inches	0.10 inches
Curies Discharged	6.26 total	20.34 total	24.35 total

W. D. Cottrell
W. D. Cottrell
Area Monitoring

WDC:cs

White Oak Dam
 mr/hr**
 Waste Mon. Analyses
 Aver. Small and Large

Settling Basin
 mr/hr**
 Waste Mon. Analyses
 Aver. Small and Large

206 - 11 A.M.
 Analyses

Date	206 - 11 A.M. Analyses	Settling Basin Waste Mon. Analyses	White Oak Dam Waste Mon. Analyses
10-18-48	0.795	1.229	0.070
10-19-48	0.675	0.705	0.067
10-20-48	0.325	0.515	0.056
10-21-48	0.378	0.448	0.059
10-22-48	0.412	0.406	0.056
Average	0.517	0.661	0.062

* mr/hr = 2.8×10^{-3} N (N = c/m³)

** mr/hr = 6.2×10^{-4} S/3 (S = c/m small cylinder)

** mr/hr = 4.1×10^{-4} L/3 (L = c/m large cylinder)



DATE: November 4, 1948

DAN ROUGE NATIONAL LABORATORY

CENTRAL FILES NUMBER

SUBJECT: Area Monitoring Report for Week Ending
October 31, 1948

48-11-137

C. A.

CONTENTS:

Part A. Salient and Non-Routine Items

- A. General Comments
- B. Air Activity Monitoring and Study
- C. Clothing Monitoring
- D. Counting Facility
- E. Liquid Waste Disposal Monitoring and Research

Part B. Statistical Data

- A. Air Activity Monitoring and Study
- B. Clothing Monitoring
- C. Counting Facility
- D. Liquid Waste Disposal Monitoring and Research

Part C. Statistical Summary

- A. Air Activity Monitoring and Study
- B. Clothing Monitoring
- C. Counting Facility
- D. Liquid Waste Disposal Monitoring and Research

Part D. Supplementary Reports

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DATE 12-23-54

For The Atomic Energy Commission

317 [Signature]

Declassification Branch

AREA MONITORING REPORT FOR WEEK ENDING
October 31, 1948

PART A. SALIENT AND NON-ROUTINE ITEMS

A. General Comments

This group assisted R. J. Morton's group and the T. V. A. in making a catch of fish in the mouth of White Oak Creek. This catch is a part of the cooperative study of Clinch River by the T. V. A. and the Health Physics Division of O.R.N.L.

B. Air Activity Monitoring and Study

A special study is being made of the diurnal peaks of air contamination as recorded by the constant air monitors located in the exclusion area.

C. Clothing Monitoring

The checking of clothing both before and after decontamination wash was started October 25, 1948.

D. Counting Facility

No salient or unusual events during this period.

E. Liquid Waste Disposal Monitoring and Research

An experimental constant sampling device is being installed at the Settling Basin. This will insure more representative sampling of the effluent than is now obtained by the grab sample method.

PART B. STATISTICAL DATA

A. Air Activity Monitoring and Study

Air Activity Measurements

Number of instances of air activity above 10% tolerance
(based on the tolerance value of 8.5×10^3 uc/cc for I-131)

C.A.M.	at	115-B	3
C.A.M.	at	735-B	None
C.A.M.	at	706-A	None

Total

3

Meteorological Data

Number of Inversions	7
Inches of Rainfall	0.00
Prevailing Wind Direction	N.E.-63.1%
Average Wind Velocity	4.2 m.p.h.

Wind direction frequency percentages and average directional velocities are tabulated below.

<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	3.0%	2.2 m.p.h.
Northeast	63.1%	5.0 m.p.h.
East	10.1%	3.5 m.p.h.
Southeast	1.8%	4.0 m.p.h.
South	6.6%	2.0 m.p.h.
Southwest	3.3%	3.1 m.p.h.
West	7.1%	2.0 m.p.h.
Northwest	0.0%	---

B. Clothing Monitoring

Laundry Decontamination Measurements	7875
Garments checked	4012
Other clothing and special items	3845
Shoes (pr.) checked	6
Water samples counted	10

C. Counting Facility

Counting Service Items	2789
Air Samples	78
Mud, Water and Smear Samples	2260
Graphical Data and Special	451

D. Liquid Waste Disposal Monitoring and Study

Discharge activity averages and pertinent data are tabulated below:

	Week Ending Oct. 31	Week Ending Oct. 24	Week Ending Oct. 17
Settling Basin	0.250 mr/hr	0.184 mr/hr	0.457 mr/hr
White Oak Dam	0.010 mr/hr	0.014 mr/hr	0.013 mr/hr
Rainfall	0.00 inches	1.65 inches	0.00 inches
Curies Discharged	22.31 Total	6.26 Total	20.34 Total

Attached is a tabulation of the gamma radiation values together with the approximate amounts of radiation which would be received from beta emitters in the effluents on the same days surveyed. These values represent radiation intensities on the basis of immersion in infinite volume assuming an average gamma ray energy of 0.7 Mev. and an average beta ray energy of 0.3 Mev. All values are calculated according to the method set forth in CH-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K. Z. Morgan.

PART C. STATISTICAL SUMMARY

A. Air Activity Monitoring and Study

The percentage data loss on the three outdoor constant Air Monitors was 2.2% this week as compared to 0.6% for last week.

B. Clothing Monitoring

The number of laundry decontamination measurements made this week increased 9.5% over last week.

C. Counting Facility

Counting service items increased 27.8% over last week.

D. Liquid Waste Disposal and Monitoring

Immersion gamma counts on 5 daily samples each of Dam and Settling Basin Water indicate an activity reduction factor of 25.0 compared to 23.5 as indicated by the results of the gross beta analysis of the same number of samples on the same days.

PART D. SUPPLEMENTARY REPORTS (No special reports for this week)

Data Contributed By: J. T. Sutherland
R. G. Lawler
M. H. Lingerfelt
C. E. Vaughn

H. D. Cottrell
H. D. COTTRELL
Area Monitoring

WDC:ac



White Oak Dam
 mr/hr*
 Waste Mon. Analyses
 Aver. Small and Large

Settling Basin
 mr/hr*
 Waste Mon. Analyses
 Aver. Small and Large

206 - 11 A.M.
 Analyses

Date	White Oak Dam mr/hr* Waste Mon. Analyses Aver. Small and Large	Settling Basin mr/hr* Waste Mon. Analyses Aver. Small and Large	206 - 11 A.M. Analyses
10-25-48	0.053	0.092	0.310
10-26-48	0.050	0.352	1.048
10-27-48	0.053	0.364	1.755
10-28-48	0.039	0.271	1.164
10-29-48	0.048	0.173	0.804
Average	0.048	0.250	1.016

mr/hr = 2.8×10^{-3} R (N = c/m/ml)

mr/hr = 6.2×10^{-4} S/3 (S = c/m small cylinder)

mr/hr = 4.1×10^{-4} L/3 (L = c/m large cylinder)



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DATE: November 17, 1948

SUBJECT: Area Monitoring Report for Week Ending
November 7, 1948

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- Part A. Salient and Non-Routine Items
 - A. General Comments
 - B. Air Activity Monitoring and Study
 - C. Clothing Monitoring
 - D. Counting Facility
 - E. Liquid Waste Disposal Monitoring and Research

- Part B. Statistical Data
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- Part C. Statistical Summary
 - A. Air Activity Monitoring and Study
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 - D. Liquid Waste Disposal Monitoring and Research

- Part D. Supplementary Reports

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November 17, 1948

AREA MONITORING REPORT FOR WEEK ENDING
November 7, 1948

PART A. SALIENT AND NON-ROUTINE ITEMS

A. General Comments

An agreement has been entered into with R. J. Morton's group, whereby they will arrange for routine collection of sludge from water filtration plants down stream from X-10, and this group will assay the samples for radioactivity.

B. Air Activity Monitoring and Study

The Electronics Section of the Instrument Division has given January 15, 1949 as the delivery date for the first of the ten logarithmic count rate meters to be used in the Constant Air Monitors in and around the X-10 Area.

C. Clothing Monitoring

The initial check on clothing shows approximately 40% to be above the permissible contamination level for the cool laundry. This increase over the expected 20% is due in a large part to the increased sensitivity of the monitoring instruments used.

D. Counting Facility

No salient or unusual events during this period.

E. Liquid Waste Disposal Monitoring and Research

An experimental constant sampling device is being installed at the Settling Basin. This will insure more representative sampling of the effluent than is now obtained by the grab sample method.

PART B. STATISTICAL DATA

A. Air Activity Monitoring and Study

Air Activity Measurements

Number of instances of air activity above 10% tolerance,
based on the tolerance value of 8.5×10^{-9} uc/cc for I^{131} . *3

*Note: This number is not necessarily the sum of the instances given for each constant air monitor, as one instance is usually recorded on more than one monitor.

PART B. STATISTICAL DATA

A. Air Activity Monitoring and Study

Air Activity Measurements (con't)

Number of instances above 10% of tolerance recorded on:

C.A.M. at	115-B	3
C.A.M. at	735-B	1
C.A.M. at	706-A	2

Meteorological Data

Number of Inversions	6
Inches of Rainfall	3.25
Prevailing Wind Direction	S.W. 30.2%
Average Wind Velocity	7.6 m.p.h.

Wind direction frequency percentages and average directional velocities are tabulated below:

<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	0.6%	5.0 m.p.h.
Northeast	17.3%	4.6 m.p.h.
East	17.9%	6.8 m.p.h.
Southeast	1.9%	10.0 m.p.h.
South	11.7%	13.5 m.p.h.
Southwest	30.2%	8.4 m.p.h.
West	20.4%	5.9 m.p.h.
Northwest	0.0%	- - - -

B. Clothing Monitoring

Laundry Decontamination Measurements	9439
Garments checked	4916
Other clothing and special items	4505
Shoes (pr.) checked	9
Water samples counted	10

C. Counting Facility

Counting Service Items	3194
Air Samples	128
Mud, Water and Smear Samples	2753
Graphical Data and Special	313

D. Liquid Waste Disposal Monitoring and Research

Discharge activity averages and pertinent data are tabulated below:

	<u>Week Ending Nov. 7</u>	<u>Week Ending Oct. 31</u>	<u>Week Ending Oct. 24</u>
Settling Basin	0.251 mr/hr	0.250 mr/hr	0.184 mr/hr
White Oak Dam	0.011 mr/hr	0.010 mr/hr	0.014 mr/hr
Rainfall	3.25 inches	0.00 inches	1.65 inches
Curies Discharged	19.80 Total	22.31 Total	6.26 Total

Attached is a tabulation of the gamma radiation values together with the approximate amounts of radiation which would be received from beta emitters in the effluents on the same days surveyed. These values represent radiation intensities on the basis of immersion in infinite volume assuming an average gamma ray energy of 0.7 Mev. and an average beta ray energy of 0.3 Mev. All values are calculated according to the method set forth in CR-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K. Z. Morgan.

PART C. STATISTICAL SUMMARY

A. Air Activity Monitoring and Study

The percentage data loss on the three outdoor constant Air Monitors was 0.0 % this week as compared to 2.2% for last week.

B. Clothing Monitoring

The number of laundry decontamination measurements made this week increased 21.1% over last week.

C. Counting Facility

Counting service items increased 14.5% over last week.

D. Liquid Waste Disposal and Monitoring

Immersion gamma counts on 5 daily samples each of Dam and Settling Basin Water indicate an activity reduction factor of 22.8 compared to 23.2 as indicated by the results of the gross beta analysis of the same number of samples on the same days.

PART D. SUPPLEMENTARY REPORTS (No special reports for this week)

Data Contributed By: J. T. Sutherland
R. G. Lawler
M. M. Lingerfelt
C. E. Vaughn

W. D. Cottrell
W. D. Cottrell
Area Monitoring

WDC:ac

Date	Settling Basin		White Oak Dam	
	Waste Mon. Analyses	Mr/hr** Aver. Small and Large	Waste Mon. Analyses	Mr/hr** Aver. Small and Large
11-1-48	0.366	0.585	0.050	0.012
11-2-48	1.339	1.702	0.059	0.012
11-3-48	2.150	0.540	0.053	0.014
11-4-48	0.777	1.447	0.064	0.009
11-5-48	2.165	2.492	0.061	0.007
Average	1.359	1.333	0.057	0.011

* mrep/hr = 2.8×10^{-3} N (N = c/m/ml)
 ** mr/hr = 6.2×10^{-4} S/3 (S = c/m small cylinder)
 *** mr/hr = 4.1×10^{-4} L/3 (L = c/m large cylinder)

CENTRAL FILES NUMBER

48-12-130

C. 7.

DATE: December 7, 1948

SUBJECT: Area Monitoring Report for Week Ending December 5, 1948

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- E. Liquid Waste Disposal Monitoring and Research

Part B. Statistical Data

- A. Air Activity Monitoring and Study
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Part C. Statistical Summary

- A. Air Activity Monitoring and Study
- B. Clothing Monitoring
- C. Counting Facility
- D. Liquid Waste Disposal Monitoring and Research

Part D. Supplementary Reports

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AREA MONITORING REPORT FOR WEEK ENDING
December 5, 1948

Part A. SALIENT AND NON-ROUTINE ITEMS

A. General Comments

Examination was made of the drill cores removed from five holes drilled in the area immediately east of the present X-10 area and southeast of the old burial ground. The inclination of rock strata would indicate that contamination from the burial ground might travel along rock seams in this general direction, and be found in these holes. No such contamination was found but all cores were found to be washed clean of the original mud from the rock seams. Three mud samples of doubtful origin, taken from the cores showed no activity. Twenty five smears taken on the cores, also showed no contamination. Further tests of this nature will probably be made soon.

B. Air Activity Monitoring And Study

The constant air monitor shelters are all scheduled to be placed by the end of the next week. They are now awaiting installation of blowers and lead pigs. Some additional carpenter work is also needed. The Constant Air Monitor previously located in 115-B is now in shelter #2 between 115-B and 735-B, directly south of 105 building. The Constant Air Monitor previously located in 725-B is now in shelter #5 located directly south of 717-BA just west of the "Restricted Area" fence and Tank Farm. When all shelters are placed, a sketch showing their location will be appended to the weekly report. An effort was made to obtain data on contamination of cardboard tubes in the Constant Air Monitors. Counts were made on the large cardboard tubes after removal, using the same geometry as in the Constant Air Monitor pig (Eck and Krebb tube inside and at the center of the cardboard tube). The impinged activity on the inside of the most contaminated of these tubes, would have increased the actual counting rate of the Constant Air Monitor from 3700 c/m to 3791 c/m or 2.5%. This particular tube had been in constant use for 40 days. Another tube that had been used only 3 days had only enough contamination to increase the actual counting rate by 0.75%. A full report of this experiment has been made to D.M. Davis.

It seems advisable that cardboard tubes be changed when contamination reaches 2% background. The background of the Constant Air Monitor after one hour of operation is about 300 to 800 counts/minute.

C. Clothing Monitoring

No salient or unusual events during this period.

D. Counting Facility

No salient or unusual events during this period.

E. Liquid Waste Disposal Monitoring and Research

The screens of the White Oak Dam spillway were cleaned and trash disposed of in hot cans. The highest reading on this trash was 7 mr/hr with Victoreen 263 at 2 inches. Fish collected in the screen were used for dissecting and counting. Fourteen were processed by Dr. Setter's Group and 4 by the Area Monitoring Group. A report of this work by the Area Monitoring Group will be completed soon.

Part B. STATISTICAL DATA

A. Air Activity Monitoring and Study

Air Activity Measurements

Number of instances of air activity above
10% tolerance, based on the tolerance value
of 2.5×10^{-8} $\mu\text{c}/\text{cc}$ for I131, .

*4

C.A.M.	at	#2	1
C.A.M.	at	#5	3
C.A.M.	at	706-A	None

Meteorological Data

Number of Inversions		4
Inches of Rainfall		3.9
Prevailing Wind Direction	East -	65.5%
Average Wind Velocity		5.4 m.p.h.

Wind direction frequency percentages and average directional velocities are tabulated below:

<u>Direction</u>	<u>Frequency</u>	<u>Velocity</u>
North	0.0%	0.0 m.p.h.
Northeast	0.6%	4.0 m.p.h.
East	65.5%	5.8 m.p.h.
Southeast	3.0%	1.4 m.p.h.
South	2.4%	2.0 m.p.h.
Southwest	9.5%	4.1 m.p.h.
West	14.3%	7.4 m.p.h.
Northwest	4.7%	1.4 m.p.h.

B. Clothing Monitoring

Laundry Decontamination Measurements

7668

Garments checked	4198
Other clothing and special items	3458
Shoes (pr.) checked	2
Water samples counted	10

*Note: This is not necessarily the sum of the instances given for each constant air monitor, as one instance is usually recorded on more than one monitor.

C. Counting Facility

Counting Service Items		3216
Air Samples	144	
Mud, Water and Smear Samples	2986	
Graphical Data and Special	106	

D. Liquid Waste Disposal Monitoring and Research

Discharge activity averages and pertinent data are tabulated below:

	Week Ending <u>Dec. 4</u>	Week Ending <u>Nov. 28</u>	Week Ending <u>Nov. 21</u>
Settling Basin	0.221 mr/hr	0.682 mr/hr	0.234 mr/hr
White Oak Dam	0.003 mr/hr	0.018 mr/hr	0.008 mr/hr
Rainfall	3.90 inches	1.30 inches	3.40 inches
Curies Discharged	13.92 Total	20.06 Total	20.02 Total

Attached is a tabulation of the gamma radiation values together with the approximate amounts of radiation which would be received from beta emitters in the effluents on the basis of immersion in infinite volume assuming an average gamma energy of 0.7 Mev. and an average beta ray energy of 0.3 Mev. All values are calculated according to the method set forth in CH-2565, "Operating Equations and Procedures Involved in Water Counting at Site X", by K.Z. Morgan.

Part C. STATISTICAL SUMMARY

A. Air Activity Monitoring and Study

The percentage data loss on the three outdoor Constant Air Monitors was 15.7% this week as compared to 15.3% for last week.

B. Clothing Monitoring

The number of laundry decontamination measurement made this week increased 2.8%.

C. Counting Facility

Counting service items increased 3.8% over last week.

D. Liquid Waste Disposal Monitoring and Research

Immersion gamma counts on 5 daily samples each of Dam and Settling Basin Water indicate an activity reduction factor of 73.6 compared to 44.2 as indicated by the results of the gross beta analyses of the same number of samples on the same days.

Part D. SUPPLEMENTARY REPORTS (No special reports for this week)

Data Contributed By: J. T. Sutherland
P. E. Brown
M. M. Lingerfelt
C. E. Vaughn

PEB:ml

W. D. Cottrell
W. D. Cottrell
Area Monitoring

-----Settling Basin ----- White Oak Dam -----

Date	\bar{S} mrep/hr* 206 - 11 A.V. Analyses	\bar{S} mrep/hr* Waste Mon. Analyses	\bar{r} m/hr** Aver. Small and Large	\bar{r} mrep/hr* Waste Mon. Analyses	\bar{r} m/hr** Aver. Small and Large
11-29	0.266	0.311	0.092	0.006	0.003
11-30	0.525	0.647	0.179	0.014	0.001
12-1	0.527	0.605	0.146	0.025	0.004
12-2	1.230	1.089	0.379	0.020	0.003
12-3	0.970	1.109	0.307	0.020	0.002
Average	0.704	0.752	0.221	0.017	0.003

* mrep/hr = 2.8×10^{-3} N(N = c/m/ml)

** m/hr = 6.2×10^{-4} S/3 (S = c/m small cylinder)

** m/hr = 4.1×10^{-4} L/3 (L = c/m large cylinder)